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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/388,010 09/01/99 LAMBERT

R 15-0195

EXAMINER

WM02/1010

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ARMSTRONG, A
ART UNIT PAPER NUMBER 5

2641
DATE MAILED:

10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/388,010

Applicant(s)

LAMBERT ET AL.

Examiner

Angela A. Armstrong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims **1 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Morgan et al.* (US Patent No. 5,329,587) in view of *Romesburg* (US Patent No. 5,796,819).

3. Regarding claims **1 and 6**;

Microphones positioned to detect speech from a single source and noise is taught by *Morgan et al.* at Figures 8 and 9: col. 7, line 57 - col. 8, line 23;

One of the microphones being designated a reference microphone and the other being designated data microphones is taught by *Morgan et al.* at Figures 8 and 9: col. 7, lines 57-8 and col. 8, lines 1-23;

Plurality of bandpass filters for eliminating a known spectral band containing noise is taught by *Morgan et al.* at col. 4, lines 27-48;

Morgan et al. do not teach **a** that the signals from the multiple microphones are processed by adaptive filters so that they may be summed together in the signal summation circuit. Refer to *Romesburg* who teach a system for echo cancellation teaches implementation of 2 or more

microphones, adaptive filtering of the outputs from the microphones and combining the adaptive filtered microphone outputs in a summation circuit (Abstract).

Therefore, it would have been obvious to one of ordinary skill at the time of invention to modify the system of *Morgan et al* to implement combining the adaptively filtered outputs of multiple microphones as taught by *Romesburg*, for the purpose of maximizing the speech signal output level and/or minimizing the noise signal output level, as suggested by *Romesburg* (col. 17, lines 13-20).

4. Claims **2 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Morgan et al* and *Romesburg* in view of *Chance et al.* (US Patent No. 4,584,441).

5. Regarding claims **2 and 7**, *Morgan et al* and *Romesburg* disclose everything as claimed in claims 1 and 6. However, *Morgan et al* and *Romesburg* do not specifically teach speech detection circuitry for enabling the adaptive filters only when speech is detected. Refer to *Chance et al.* who teach an adaptive voice frequency repeater for echo cancellation, which implements signal detection and inhibits the adaptation process if voice signals are not detected (col.1, lines 11-47), to prevent the system from adapting to an undesirable response characteristic (non-voice signal) and degrade the signal quality of the desired normal (voice) signals.

Therefore, it would have been obvious to one of ordinary skill at the time of invention to modify the adaptive filtering process of *Morgan et al* and *Romesburg* to implement the signal detection and inhibition techniques of *Chance et al.*, for the purpose of preventing the

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degradation of the voice signal quality if the system is allowed to adapt to an undesired response characteristic (non-voice signals), as taught by *Chance et al.*

6. Claims **3-5 and 8-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Morgan et al and Romesburg* in view of *Torkkola* (US Patent No. 5,675,659).

7. Regarding claims **3 and 8**, *Morgan et al and Romesburg* disclose everything as claimed in claims 1 and 6. However, *Morgan et al and Romesburg* do not specifically teach speech-conditioning circuitry to reduce reverberation effects. Refer to *Torkkola*, who teach a method of signal processing for combined output signals which is applicable in many applications for achieving speech signal enhancement in noisy environments, speaker separation in teleconferencing environments, elimination of multipath reverberation distortion, reduction of interference and situations and they suggest that such a system is highly desirable in real world conditions (col. 1, lines 10-46 and col. 2, lines 14-40).

Therefore, it would have been obvious to one of ordinary skill at the time of invention to modify the adaptive filtering system of *Morgan et al.* to implement signal processing techniques for combined output signals to achieve speech signal enhancement and elimination of reverberation distortion, as suggested by *Torkkola*, which are highly desirable in real world conditions, as also taught by *Torkkola*.

8. Regarding claims **4-5 and 9-10**,

Means for filtering data microphone output signals by convolution with a vector of weight values is taught by *Morgan et al.* at col. 5, lines 45-68 to col. 6, lines 1-43;

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Means for comparing the filtered data microphone output signals with reference microphone output signals and deriving therefrom an error signal is taught by *Morgan et al.* at col. 5, lines 45-68 to col. 6, lines 1-43;

Means for adjusting the weight values is taught by *Morgan et al.* at col. 5, lines 45-68 to col. 6, lines 1-43;

Fast Fourier transform means to transform blocks of data microphone output signals is taught by *Morgan et al.* at col. 5, lines 45-68 to col. 6, lines 1-43.

Response to Arguments

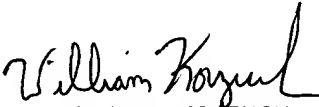
9. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Angela A. Armstrong** whose telephone number is **703-308-6258**. The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **William R. Korzuch** can be reached on **703-305-6137**. The fax phone numbers for the organization where this application or proceeding is assigned are **703-308-6306** for regular communications and **703-308-6296** for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is **703-305-3900**.

AAA
October 5, 2001


WILLIAM KORZUCH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600